

Strength of Materials MCQ Question Answer

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Question: 1. In a belt drive, the pulley diameter is doubled, the belt tension and pulley width remaining same. The changes required in key will be

- Option A. Increase key length
- Option B. Increase key depth
- Option C. Increase key width
- Option D. Double all the dimensions

Question: 2. The energy stored in a body when strained within elastic limit is known as

- Option A. Resilience
- Option B. Proof resilience
- Option C. Strain energy
- Option D. Impact energy

Question: 3. Tensile strength of a material is obtained by dividing the maximum load during the test by the

- Option A. Area at the time of fracture
- Option B. Original cross-sectional area
- Option C. Average of (A) and (B)
- Option D. Minimum area after fracture

Question: 4. A pressure vessel is said to be a thick shell, when

- Option A. It is made of thick sheets
- Option B. The internal pressure is very high
- Option C. The ratio of wall thickness of the vessel to its diameter is less than $1/10$.
- Option D. The ratio of wall thickness of the vessel to its diameter is greater than $1/10$.

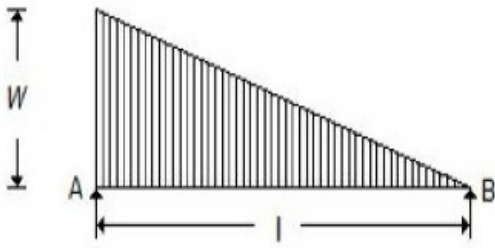
Question: 5. The ratio of the largest load in a test to the original cross-sectional area of the test piece is called

- Option A. Elastic limit
- Option B. Yield stress
- Option C. Ultimate stress
- Option D. Breaking stress

Question: 6. The buckling load for a given material depends on

- Option A. Slenderness ratio and area of cross-section
- Option B. Poisson's ratio and modulus of elasticity
- Option C. Slenderness ratio and modulus of elasticity
- Option D. Slenderness ratio, area of cross-section and modulus of elasticity

Question: 7. A simply supported beam with a gradually varying load from zero at B and w per unit length at A is shown in the below figure. The shear force at B is equal to



- Option A. $wl/6$
- Option B. $wl/3$
- Option C. wl
- Option D. $2wl/3$

Question: 8. Modulus of rigidity is defined as the ratio of

- Option A. Longitudinal stress to longitudinal strain
- Option B. Volumetric stress to volumetric strain
- Option C. Lateral stress to Lateral strain
- Option D. Shear stress to shear strain

Question: 9. The strain energy stored in a body due to suddenly applied load compared to when it is applied gradually is

- Option A. Same
- Option B. Twice
- Option C. Four times
- Option D. Eight times

Question: 10. Which of the following is a proper sequence?

- Option A. Proportional limit, elastic limit, yielding, failure
- Option B. Elastic limit, proportional limit, yielding, failure
- Option C. Yielding, proportional limit, elastic limit, failure
- Option D. None of the above

Question: 11. Strain is equal to (where l = Original length, and δl = Change in length)

- Option A. $l/\delta l$
- Option B. $\delta l/l$
- Option C. $l.\delta l$
- Option D. $l + \delta l$

Question: 12. The bending stress in a beam is _____ section modulus.

- Option A. Inversely proportional to two times
- Option B. Directly proportional to
- Option C. Inversely proportional to
- Option D. None of these

Question: 13. The unit of Young's modulus is

- Option A. mm/mm
- Option B. kg/cm
- Option C. Kg
- Option D. kg/cm²

Question: 14. Euler's formula holds good only for

- Option A. Short columns
- Option B. Long columns
- Option C. Both short and long columns
- Option D. Weak columns

Question: 15. The tensile strength of the welded joint for double fillet is (where s = Leg or size of the weld, l = Length of weld, and σ_t = Allowable tensile stress for weld metal)

- Option A. $0.5 s.l.\sigma_t$
- Option B. $s.l.\sigma_t$
- Option C. $\sqrt{2} s.l.\sigma_t$
- Option D. $2.s.l.\sigma_t$

Question: 16. A fletched beam is used to

- Option A. Change the shape of the beam
- Option B. Effect the saving in material
- Option C. Equalise the strength in tension and compression
- Option D. Increase the cross-section of the beam

Question: 17. When a body is subjected to three mutually perpendicular stresses, of equal intensity, the ratio of direct stress to the corresponding volumetric strain is known as

- Option A. Young's modulus
- Option B. Modulus of rigidity
- Option C. Bulk modulus
- Option D. Poisson's ratio

Question: 18. The ratio of maximum shear stress developed in a rectangular beam and a circular beam of the same cross-sectional area is

- Option A. $2/3$
- Option B. $3/4$
- Option C. 1
- Option D. $9/8$

Question: 19. The ratio of direct stress to volumetric strain in case of a body subjected to three mutually perpendicular stresses of equal intensity, is equal to

- Option A. Young's modulus
- Option B. Bulk modulus
- Option C. Modulus of rigidity
- Option D. Modulus of elasticity

Question: 20. The ultimate tensile stress of mild steel compared to ultimate compressive stress is

- Option A. Same
- Option B. More
- Option C. Less
- Option D. Unpredictable

Question: 21. The limit of eccentricity for no tensile conditions for a column of circular section of diameter (D) is

- Option A. $d/4$
- Option B. $d/8$
- Option C. $d/12$
- Option D. $d/16$

Question: 22. Percentage reduction of area in performing tensile test on cast iron may be of the order of

- Option A. 50 %
- Option B. 25 %
- Option C. 0 %
- Option D. 15 %

Question: 23. Proof resilience per material is known as

- Option A. Resilience
- Option B. Proof resilience
- Option C. Modulus of resilience
- Option D. Toughness

Question: 24. If T_h is the torque resisting capacity of a hollow shaft and T_s is that of a solid shaft, of the same material, length and weight. Then,

- Option A. $T_h > T_s$
- Option B. $T_h < T_s$
- Option C. $T_h = T_s$
- Option D. None of these

Question: 25. A boiler shell 200 cm diameter and plate thickness 1.5 cm is subjected to internal pressure of 1.5 MN/m², and then the hoop stress will be

- Option A. 30 MN/m²
- Option B. 50 MN/m²
- Option C. 100 MN/m²

Option D. 200 MN/m^2

Question: 26. A hollow shaft of same cross-section area as compared to a solid shaft transmit

Option A. Same torque

Option B. Less torque

Option C. More torque

Option D. Unpredictable

Question: 27. Volumetric strain for a rectangular specimen of length l , breadth b and thickness t subjected to a pull of P is given by

Option A. $e (1 - 2m)$

Option B. $e (1 - 2/m)$

Option C. $e (m - 2)$

Option D. $e (2/m - 1)$

Question: 28. Young's modulus of a wire is defined as the stress which will increase the length of wire compared to its original length by

Option A. Half

Option B. Same amount

Option C. Double

Option D. One-fourth

Question: 29. The safe twisting moment for a compound shaft is equal to the

Option A. Maximum calculated value

Option B. Minimum calculated value

Option C. Mean value

Option D. Extreme value

Question: 30. Elasticity of Mild Steel specimen is defined by

Option A. Hooke's law

Option B. Yield point

Option C. Plastic flow

Option D. Proof stress

Answer Sheet

1	C	
2	C	
3	B	
4	D	
5	C	
6	D	
7	A	
8	D	
9	C	
10	A	
11	B	
12	C	
13	D	
14	B	
15	C	
16	C	
17	C	
18	D	
19	B	
20	B	
21	B	
22	C	
23	C	
24	A	
25	C	
26	C	
27	B	
28	B	
29	B	
30	C	